

U.S. Patent Application Serial No. 10/539,120
Amendment filed December 11, 2008
Reply to OA dated September 17, 2008

REMARKS

Claims 1-12 are pending in this application. Claims 3, 7, 8 and 12 are canceled without prejudice or disclaimer, and claim 1 is amended herein. Upon entry of this amendment, claims 1, 2, 4-6 and 9-11 will be pending. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for the amendments to the claims is detailed below.

Claims 1-2 are rejected under 35 U.S.C. §103(a) as being unpatentable over Momose et al. (JP 2001-062391). (Office action paragraph no. 2)

Claims 1, 2 and 8-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Onishi et al. (JP 11-300271) in view of Momose et al. (Office action paragraph no. 3)

Claims 3-7 are rejected under 35 U.S.C. §103(a) as being unpatentable over Onishi et al. (JP 11-300271) in view of Momose et al. , as applied above, and further in view of Geary et al. (US 4,801,680) (Office action paragraph no. 4)

Claims 8-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Momose et al. in view of Onishi et al. (Office action paragraph no. 5)

The rejection of claims 3, 7, 8 and 12 is moot in view of the cancellation of these claims without prejudice or disclaimer. Reconsideration of the rejection of the pending claims is

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respectfully requested in view of the amendment to base claim 1. Support for the amendment to claim 1 may be found in original claims 3, 7, 8 and 12.

The method of forming a coating film in base claim 1 comprises the steps of:

- (1) coating an aluminum substrate with a thermosetting polyester resin lustrous powder base coating composition (a) containing a lustrous material, and baking the resulting base coat layer; and
- (2) coating the base coat layer with a thermosetting acrylic resin clear powder coating composition (b), and baking the resulting clear coat layer to obtain a lustrous multilayer coating film.

In claim 1, as amended, specific coating compositions are used as the lustrous base coating composition (a) and the clear powder coating composition (b).

Specifically, “a lustrous base coating composition comprising a carboxyl-containing polyester resin (base resin) and a β -hydroxyalkylamide (a cross-linking agent)” is used as the lustrous base coating composition; and “a clear coating comprising an epoxy-containing acrylic resin (base resin) and polycarboxylic acid and/or an anhydride thereof (a cross-linking agent)” is used as the clear powder coating composition of the present invention.

The present invention succeeds in obtaining a multilayer coating film with excellent interlayer adhesion by specifying the ratio of each component in the above-mentioned specific coating composition.

Specifically, the ratio of β -hydroxyalkylamide to carboxyl-containing polyester resin is such that the number of β -hydroxyalkylamide hydroxyl groups is about 1.2 to about 1.6 per polyester resin carboxyl group.

Furthermore, in the clear coating composition (b), the ratio of the polycarboxylic acid and/or anhydride thereof to the epoxy-containing acrylic resin is such that the total number of carboxyl groups and anhydride groups thereof in the polycarboxylic acid and/or anhydride thereof is about 0.6 to about 0.9 per acrylic resin epoxy group.

By fulfilling these conditions, **the distinguishing effects of the present invention**, i.e., the obtainment of a multilayer coating film having excellent interlayer adhesion, can be achieved.

This is clear from the Examples and Comparative Examples disclosed in the present specification. In the Examples of the present invention, coating compositions (1A, 1B, and 1C in Table 1 of the present specification) that satisfy the above range of the ratio of the base resin to the cross-linking agent were used as the powder lustrous base coating composition. In addition, coating compositions (2A, 2B, and 2C of Table 2 in the present specification) that satisfy the above range of the ratio of the base resin to the cross-linking agent were used as the powder coating composition. This resulted in the obtainment of a multilayer coating film having excellent interlayer adhesion (Examples 1-5 in Table 3). Comparatively, when a powder lustrous base coating composition that does not satisfy the above content ratio of the base resin to the cross-linking agent (1D and 1E in Table 1 of the present specification) and/or a clear powder coating composition (2D and 2E of Table 2 of the present specification) that does not satisfy the above content ratio of the base resin to the cross-linking agent was used, the resulting multilayer coating film failed to show satisfactory interlayer adhesion (Comparative Examples 1-4 in Table 3 of the present specification).

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As described above, a lustrous multilayer coating film with excellent interlayer adhesion can be obtained by setting both the content ratio of the base resin to the cross-linking agent in the lustrous base coating composition (a) and the content ratio of the base resin to the cross-linking agent in the clear powder coating composition (b) within specified ranges. This is an **unexpected effect** of the present invention, and the effect is fully commensurate in scope with the present claims.

None of the Momose, Onishi and Geary references discloses the formation of a lustrous multilayer coating film using a lustrous base coating composition (a) that satisfies the above range of the content ratio of the base resin to the cross-linking agent, and a clear powder coating composition (b) that satisfies the above range of the content ratio of the base resin to the cross-linking agent.

Momose, Onishi and Geary do not teach or suggest the formation of a multilayer coating film using a lustrous base coating composition (a) that contains a carboxyl-containing polyester resin and a β -hydroxyalkylamide together with a clear powder coating composition that contains an epoxy-containing acrylic resin and a polycarboxylic acid and/or an anhydride thereof.

Accordingly, one of skill in the art would not have expected, from the disclosures of Momose, Onishi and Geary, that a lustrous multilayer coating film with excellent interlayer adhesion can be obtained by specifying the content ratio of the base resin to the cross-linking agent in the lustrous base coating composition (a) and that of the base resin to the cross-linking agent in the clear powder coating composition (b).

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The pending claims are therefore not obvious over Momose, Onishi and Geary, taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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